



**Submission to Government on IOOA member  
companies in Ireland's  
low-carbon energy transition**

## **Introduction**

Approximately 11% of Ireland's energy requirements are currently met from renewable sources<sup>1</sup>. While growth in renewable energy is developing rapidly, so too is our energy demand. The necessary transition away from fossil fuels to renewable sources requires a coherent, realistic and integrated strategy that will ensure energy security and affordability without significant damage to the economy or society.

During the energy transition, reliable energy sources, particularly gas (the cleanest fossil fuel with 40% less CO<sub>2</sub> emissions than coal), will be required in Ireland to provide the necessary base load backup for intermittent renewable energy sources such as wind and solar. Ireland currently has no direct link to mainland Europe gas or power networks, resulting in a significant potential risk to energy security in the event of gas interruptions.

The oil and gas industry can play a vital role in driving Ireland's transition to a low carbon economy. This can be done by exploring for and developing in a safe and environmentally responsible manner, indigenous offshore hydrocarbons, particularly gas to replace the Kinsale Head and Corrib fields. For Ireland, this can ensure security of affordable energy as well as having the benefit of providing significant incremental revenue for the Irish exchequer, which can contribute to funding the transition to a low carbon economy.

Additionally, the Irish Offshore Operators' Association (IOOA) member companies can and do play a leading role in developing and upscaling new renewable energy technologies on a global scale. Partnering the oil and gas industry with the developing renewables industry through natural synergies that utilise the expertise, innovations, new technologies and financial capabilities of the oil and gas sector is essential in order to make the transition to a better and sustainable energy future.

## **The role of the oil and gas industry in renewable energy and environmental sustainability**

The oil and gas industry is making a significant impact globally on tackling greenhouse gas emissions and especially in the development of renewable energy through major research and investment. For example, the Oil and Gas Climate Initiative (OGCI)<sup>2</sup> is a CEO-led initiative of 13 of the largest oil and gas companies (including four IOOA members) that is taking practical action on climate change. OGCI members are leveraging their collective strength to lower carbon footprints of energy and transport through policies, investment and development and deployment of new technologies. This includes a \$1 billion+ investment fund established to lower the carbon footprint of the energy and industrial sectors. Investments are focussed on three objectives: (1) Reducing Methane leakage, (2) Reducing CO<sub>2</sub> and (3) Recycling CO<sub>2</sub> (CCUS). Four IOOA member companies are members of OGCI, while several other OGCI member companies previously held licences and drilled wells in the Irish offshore.

A number of important renewable energy and low-carbon initiatives and projects in which the oil industry, through its engineering and technical expertise, is making globally are described below. Further details of the contribution of individual member companies on an international stage are included in the Appendix. Application of some of these initiatives to Ireland could have a very significant impact in helping to meet our emissions targets. Without them, it is highly unlikely that the targets of the Paris Agreement can be met either locally or globally.

- **Offshore wind energy.** The oil and gas industry has unparalleled expertise in offshore technologies. These include optimum site identification, and the installation and operation of fixed platforms. However, offshore wind is expensive and challenging for a variety of reasons, one of which is the cost of installation of platforms that are fixed to the seabed. The oil industry has developed a range of tethered buoyant and floating platforms used for oil and gas production. The world's first floating windfarm was recently developed, by *Equinor*, in the North Sea<sup>3</sup>. Working with the oil industry, this technology offers significant opportunity for utilization and development for the wind energy sector in Ireland. *CNOOC* began operating China's the first offshore wind energy plant 12 years ago, while *Total* is about to enter the offshore wind technology sector.

- **Carbon Capture and Sequestration (CCS).** All realistic scenarios for achieving the Paris Agreement targets include a major role of CCS as a major emission-reducing technology<sup>4,5</sup>. This would allow the use of oil and gas as a transition energy source while minimizing CO<sub>2</sub> emissions and either storing them permanently in the subsurface (e.g., in old oil or gas fields) or utilizing them in the manufacture of fuels, carbonates, polymers, chemicals or aggregates. The technology, also known as CCUS (Carbon Capture, Utilisation and Storage) has been proven by oil industry research in industrial-scale demonstration projects both onshore and offshore. The Sleipner demonstration project<sup>6</sup> in the offshore Norwegian North Sea, led by *Equinor*, has been successfully and safely injecting 1 million tonnes of CO<sub>2</sub> per annum since 1996. *ExxonMobil's* CCS technology, improving the efficiency and affordability of carbon capture, is allowing the onshore capture of 7 million tonnes per annum.
- **Solar energy.** The oil and gas industry is investing significant amounts of money in solar energy globally. *Total* has ranked among the solar industry's leading companies since 2011, with a currently installed renewable power generation capacity of almost 2 GWp, developing and operating the most efficient solar plants located in Japan, South Africa, EAE and Chile<sup>7</sup>. As an integrated operator, Total is present across the entire photovoltaic solar energy value chain from cell manufacturing to solar power storage and electricity sales.
- **Advanced biofuels.** While at an early stage of development, research on the transformation of algae and plant waste into biofuels are showing promising results. The world's oil and gas was produced over geological time by transformation from algae and plant material. Current research is working to identify and enhance strains of algae that are capable of growth and transformation into a renewable and lower emission (50% lower lifecycle emissions) transport fuel. *ExxonMobil* are leading research in this area<sup>8</sup>.
- **Underground energy storage.** Many renewable energy systems, e.g., wind turbines, are intermittent, and often produce excess energy at times when it is not required. Much research is currently ongoing in order to develop methods of energy storage. One of the ways in which energy can be stored is by using excess energy to compress and inject air into subsurface shallow reservoirs from where it can be released on demand as an energy source. A small number of such large-scale schemes<sup>9</sup> have been developed in Germany (Huntorf)<sup>10</sup> and in the USA (McIntosh)<sup>11</sup>. The oil industry's expertise can be invaluable in the identification of suitable subsurface locations using seismic and drilling technologies, and in the development of the storage reservoirs.

- **Enhanced geothermal energy.** Deep geothermal energy offers significant opportunities in many parts of the world, including Ireland. Geothermal energy is currently being utilized significantly in the USA (e.g. California), Japan, Italy, New Zealand and Iceland. There is increasing interest in geothermal energy in other European countries including France and Germany. This requires drilling of boreholes, enhancement of subsurface reservoir and flow pathways, pumping of cold water into the subsurface, allowing it to heat in contact with the warmer subsurface rocks and waters at depth, and returning to the surface as hot or super-heated water. The oil industry has unrivalled expertise in all aspects of these technologies. In addition, recent research has indicated the significant potential power potential from hot water from producing oil fields<sup>12</sup>. *Providence Resources* also recently highlighted the geothermal resource potential from the Irish Atlantic margin<sup>13</sup>.
- **Substituting indigenous oil and gas for imported hydrocarbons.** This provides local skilled jobs and generates revenue for government while supplying part of our domestic needs. It keeps money in the economy that would otherwise be sent abroad. It helps strengthen national and regional bargaining positions in determining import costs. Imported energy requires additional energy and increases CO<sub>2</sub> emissions before it reaches the country. Oil and gas from Europe emits one third less CO<sub>2</sub> than if it was produced outside Europe<sup>14</sup>. As the EU is a net oil and gas importer, it is vital that we develop and use indigenous resources rather than import them from outside Europe.
- **Environmental mapping and monitoring.** The oil industry has been a leader in developing technologies and in mapping and monitoring environmental aspects of the offshore. This includes the identification and mapping of cold water corals by seismic techniques<sup>15</sup>, and the acoustic monitoring of cetaceans (whales and dolphins)<sup>16</sup> in the deep-water Atlantic Margin basins. This research, involving **Woodside** (who were awarded the Marine Industry Offshore Ireland Award for this work in 2017), is critical to providing baseline data to ensure environmental management of offshore marine waters. There have also been some exciting developments in methods of gathering dispersed plastics in the oceans using modifications of seismic technologies.
- **Geoscience research and technology.** Ireland currently has significant expertise in a range of geoscience research, based in research institutions, e.g. the joint SFI/industry-funded iCRAG (Irish Centre for Research in Applied Geosciences)<sup>17</sup> and in a number of oil companies' Irish-based offices. Such applied research has the potential to be transformational in knowledge development and exchange across various sectors (e.g., oil and gas, minerals, water, marine and renewable energy) and has the potential to be world-leading with Irish institutions helping at international level to advance low-carbon and environmental understanding and technologies.

In order that projects and initiatives of the type outlined above can be attracted to Ireland, it is essential that the oil and gas industry continues to be attracted to, and remain active in, Ireland carrying out exploration and production. This will enable collaboration with the renewables sector in developing innovative and essential renewable energy technologies and projects.

IOOA would be pleased to provide any further information or discussion required on any of the above aspects. Our industry is keen to provide evidence-based and robust information to inform policy and planning, and to work working with all stakeholders in the transition to a low-carbon future.

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## Appendix

Examples of IOOA members' renewable energy expertise and projects (modified from document submitted on 8<sup>th</sup> November 2019)

### Equinor

Equinor is a broad energy company committed to developing its business in support of the ambitions of the Paris Agreement. It is building a high value and lower carbon oil and gas portfolio, establishing an industrial position in renewables and embedding climate risk into investments and decision-making.



Equinor believe adopting a collaborative approach is fundamental to tackle the challenges of climate change and we therefore work closely with peers and partners to contribute to solving this global issue. Achieving the ambitions of the Paris Agreement will demand significant efforts across society, from regulators to consumers, from individual companies to industry associations.

In light of the belief that collaboration is key to achieving the ambitions of the Paris Agreement, we would like to take the opportunity to share with you our climate policy recommendations which are now available on our website: <https://www.equinor.com/en/how-and-why/sustainability.html#>

#### Flagship Projects

**Dogger Bank (UK):** Equinor, in partnership with SSE, is developing the world's largest offshore wind farm to provide power to 4.5m British homes. This will substantially increase Equinor's footprint in the world's largest wind market, where it is already powering 650,000 homes including from the world's first floating windfarm it operates off Scotland.

**Empire Offshore (USA):** Harnessing the winds of the Atlantic, Equinor is developing the empire field off Long Island, New York. This field, one of the largest in the Americas, will provide electricity to 1m homes.

**Sleipner West Carbon Capture and Storage:** For almost a quarter of a century Equinor has led the way on CCS with this project. *Operational since 1996 it captures about 1 million tonnes of CO<sub>2</sub> each year from the natural gas on the Equinor-operated Sleipner field in the Norwegian sector of the North Sea. The CO<sub>2</sub> is stored in a saline formation 1 km below the seabed.*

## ExxonMobil

**ExxonMobil has captured more carbon than other company.** CCS technology developed in the 1970's is allowing Exxon to capture **7m tonnes a year**. Cumulatively it **accounts for about 40% of captured and stored carbon worldwide.**



Committed to continuous innovating in the area In 2016, ExxonMobil announced a partnership with FuelCell Energy, Inc. to advance new technology that may substantially improve the efficiency, effectiveness and affordability of carbon capture. This novel technology uses carbonate fuel cells to concentrate carbon dioxide from large-scale industrial and power plants.

The company is also leading **advances in bio-fuels**. Scientists at ExxonMobil are working to transform algae and plant waste into biofuels that could one day be used for transportation. These advanced biofuels **offer the possibility of achieving significant greenhouse gas reductions** compared to today's transportation fuels. They could also minimize impacts on land, fresh water and food supplies compared with traditional biofuels like corn or sugar cane. Algae naturally produce oils that can be turned into a renewable, lower-emission fuel. ExxonMobil and Synthetic Genomics, Inc. (SGI) are working together to identify and enhance algae strains capable of high lipid production while maintaining desirable growth rates.

## Eni

**Eni is developing renewable energies projects on a worldwide basis**, both brownfield and greenfield, with the objective to install **1.6 GW of new solar, wind and storage capacity by 2022 and 5 GW by 2025**. Eni's engagement in **renewable energy complements the traditional business** as the company aims to extend the value chain and capitalise upon the synergies that exist among the various lines of business. This strategy allows Eni to pursue the strategic priority of decarbonisation while creating at the same time long-term value for all its stakeholders.



### Flagship Projects

**Progetto Italia:** calls for developing renewable energy plants in Italy in close proximity to existing Eni industrial assets. These new plants will power nearby facilities or transmit electricity into the grid. A total of **25 projects** have been identified to date, three of which are already completed and operational, representing a combined installed capacity of around **220 MW by 2021**.

**Badamsha, Kazakhstan:** This onshore wind project stems from an agreement signed in June 2017 by Eni, General Electric (GE) and the Ministry of Energy of the Republic of Kazakhstan for the joint development of renewable energy projects in Kazakhstan and is Eni's first development project in the onshore wind energy sector. With a total of **48 MW**, the plant will increase the amount of energy produced by all of the country's active wind sources by 25%.

**Katherine, Australia:** The **33.7 MWp** solar farm in Katherine, in Australia's Northern Territory, will be the territory's largest. It will be integrated with a battery storage system with a capacity of 5.7 MVA / 2.9 MWh. This project will help the Northern Territory Government to achieve its objective of producing 50% of its energy from renewable sources by 2030. Once operational, the photovoltaic plant will prevent some **63,000 tonnes** of CO<sub>2</sub> from being released into the atmosphere every year.

## Total

Total is **committed to a 20% low carbon portfolio within the next 20-years**. Already the company has invested significant sums in offshore wind, solar carbon capture and storage. A €100m a year fund has also been established dedicated to "nature-based solutions". Total's main renewable projects are in countries where the company already had offshore exploration experience.



### Flagship projects:

**UK Offshore Wind:** Total is to enter the largest wind generation market through the development of offshore technology. The intention was announced in September. It will join other industry leaders in the market – including another IOOA member (Equinor).

**Nano all weather solar farm: Built over 25 hectares, it generates enough power to serve 9,000 Japanese households through more than 80,000 high efficiency SunPower solar panels.**

As a pioneer in **biofuels**, for more than 20 years Total has been producing ethyl tert-butyl ether (ETBE), a gasoline additive, as well as hydrotreated vegetable oil (HVO), which is used for diesel. Total is **Europe's leading retailer of biofuels**, with more than 2.4 million metric tons incorporated into our gasoline and diesel in 2018.

## CNOOC

China National Offshore Oil Corp is expanding its presence in the offshore wind sector this year to develop its clean energy portfolio, following its involvement in a related project in East China's Jiangsu province in January.



The **company first entered the offshore wind business in 2006**. In 2007, CNOOC began operating the Chinese mainland's first offshore wind power plant, located in Liaodong Bay in the Bohai Sea, with an **installed capacity of 1.5 megawatts**.

The company's transition back into the field aligns with the Chinese government's recent efforts to promote renewable energy, as the country moves to replace fossil fuels with clean energy sources.

## **Nephin Energy/Canadian Pension Plan Investment Board (CPPIB)**

CPPIB believe organisations that manage environmental, social and governance factors effectively are more likely to endure and create sustainable value over the long term.



Nephin Energy, Ireland's largest domestic producer of natural gas, is a wholly owned subsidiary of CPPIB. The Dublin based company, led by a team of experienced Irish executives holds a 43.5% interest in the Corrib Gas Field. Nephin's mandate is to invest in assets right across the energy spectrum, in particular renewable energy.

CPPIB has made a number of significant investments in the renewables space globally. Some examples include their 50-50 joint venture with Votorantium Energia, a major investor in hydro, wind and thermal power plants in Brazil.

CPPIB has invested C\$2.25 billion to acquire 49% of Enbridge, a North American leader in energy delivery, transmission and distribution. Enbridge has a significant and growing investment in natural gas and renewable energy. CPPIB and Enbridge have also agreed to enter a 50-50 joint venture to pursue future European offshore wind projects.

Most recently CPPIB has announced a \$6.1bl deal to acquire Pattern Energy which is one of the most experienced renewable energy developers in North America and Japan.